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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,900	09/05/2003	Dragos Axinte	573878011US1	1541

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EXAMINER	
RALIS, STEPHEN J.	
ART UNIT	**PAPER NUMBER**
3742	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/22/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/656,900	AXINTE ET AL.	
	Examiner	Art Unit	
	Stephen J. Ralis	3742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 October 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *19-80* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *19-80* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/06/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 06 October 2006 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 19, 22, 26, 28, 37, 40, 42, 43, 46, 48-50, 54, 61, 62, 64, 65, 66 and 68 are rejected under 35 U.S.C. 102(b) as being anticipated by Fiel et al. (U.S. Patent No. 5,414,927).

Fiel et al. explicitly discloses an electronic apparatus (furnace), comprising: an electrical power source; and a heating device (heating element 13, 37, 43 made of graphite; column 3, lines 30-43; column 4, lines 20 – column 5, line12; column 7, line 7

– column 8, line 49) electrically connected to said electrical power source such that current may be transmitted through a portion thereof via a transmission structure (terminal posts 14, terminal block 39/terminal strip 40 and bolts 41 combination, etc.), the heating device having an electrical resistivity of 1,500 micro-Ohm-cm or greater (450 –1200 micro-ohms-in converted to 1143 – 3048 micro-ohms-cm; see Table I), a flexural strength of at least about 1,500 psi (most carbon having 4000-6000 psi; invention 10000 – 18000 psi; column 4, lines 5 – page 5, line 7; column 10, claim 9; see Table I), and a density of about 1.5 to 1.75 g/cc (of at least about 1.75 g/cc; column 10, claim 9; see Table I).

With respect to the limitation of claims 19 and 49 and an electrical power source, Fiel et al. disclose a furnace supplying electrical potential to the heating element (13) via two terminal posts (14), which would inherently have an electrical power source.

With respect to the limitation of claim 28 and a body constructed of a heat resistant material, Fiel et al. disclose a heat shield (18) constructed of graphite (column 3, lines 46-57) and graphite has anisotropic properties that make it inherently heat resistant.

As the reference meets all material limitations of the claims at hand, the reference is anticipatory.

4. Claims 69-71 are rejected under 35 U.S.C. 102(b) as being anticipated by Low (U.S. Patent No. 3,621,193).

Low disclose a soldering tool comprising an electrical power storage source (AC source 10); electrodes (64, 66) for soldering; an electrical switch (foot switch 38) to selectively connecting the heating device to the electrical power (column 2, lines 20-34) and when the switch is closed (activated) the electrodes (64, 66) are respectively connected to the positive and negative terminals to solder a workpiece (column 2, lines 20-34; see Figure 1). Low further disclose the electrodes (64, 66) being spaced apart (see Figure 1) and when the switch is open, electricity is not transmitted to the electrodes (64, 66)(column 2, lines 20-34).

As the reference meets all material limitations of the claims at hand, the reference is anticipatory.

5. Claims 69-78 are rejected under 35 U.S.C. 102(b) as being anticipated by Walton (U.S. Patent No. 3,889,654).

With respect to the limitations of claims 69-72, Walton discloses a soldering tool comprising an electrical power storage source (battery means 25); electrodes (electrical conductors 62,63) for providing soldering; an electrical switch (push button 20) disposed on the body (column 2, lines 43-47) to selectively connecting the heating device to the electrical power (column 2, line 42 – column 3, line 14) and when the switch is closed (activated) the electrodes (electrical conductors 62,63) are respectively connected to the positive and negative terminals to solder a workpiece (column 2, line 42 – column 3, line 14; see Figure 4). Walton further discloses the electrodes (electrical conductors 62,63) being spaced apart (see Figures 4-7) and when the switch is open, electricity is

not transmitted to the electrodes (electrical conductors 62,63)(column 2, line 62 – column 3, line 6).

With respect to the limitation of claims 73-78, Walton discloses a portable cordless soldering iron comprising a heating element (60) having first and second electrodes (electrical conductors 62,63; column 4, lines 1-10) associated with the body (11)(see Figures 1-7); an electrical switch for enabling and disabling the heating device disposed on the body (20; column 2, line 42 – column 3, line 14). Walton further discloses a rechargeable battery means (25) disposed in the lower housing portion (12) of housing (11) (column 2, lines 47-52).

As the reference meets all material limitations of the claims at hand, the reference is anticipatory.

Joint Inventors – Common Ownership Presumed

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 20, 21, 38, 39, 44 and 45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fiel et al. (U.S. Patent No. 5,414,927) in view of Sweetland (U.S. Patent No. 5,394,910).

The claims differ from Fiel in calling for the heating device having a thermal conductivity of less than or equal to 10 BTU/hr-ft-degree F.

Sweetland teaches that typical carbon and graphite used in high temperature applications have an average thermal conductivity of 8 BTU/hr-ft-degree F, Sweetland further teaches that some applications prefer high thermal conductivity ranges such as 50 or 60 BTU/hr-ft-degree F . It would have been obvious to one of ordinary skill in the art at the time of the invention was made to make having a thermal conductivity of less than or equal to 10 BTU/hr-ft-degree F, since it has been held that where the general

conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

With respect to the limitations of claims 21, 39 and 45 and said heating device has an electrical resistivity of over 3000 micro-Ohm-cm, Fiel discloses a heating device having an electrical resistivity of over 3000 micro-Ohm-cm (450 –1200 micro-ohms-in converted to 1143 – 3048 micro-ohms-cm; see Table I).

10. Claims 23-27, 41-43, 46-48, 51-53, 55, 63 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Funari (U.S. Patent No. 4,171,477) in view of Fiel et al. (U.S. Patent No. 5,414,927).

Funari discloses an apparatus comprising an electrical power source (battery 23; column 5, lines 58-63; see Figure 3a), a heating device being a soldering tip including a first and second electrode (column 9, lines 10-20; see Figure 6) constructed of a material that may include a large range of micro-ohm-cm based on the material, where the material of notability is a material combination of carbide and graphite having a resistivity of 3200 micro-ohms-cm and up (column 7, line 58 – column 8, line 12).

The claims differ from Funari in calling for the graphite heating device having a flexural strength of at least about 1,500 psi and a density of about 1.5 to 1.75 g/cc.

However, a heating device comprising a graphite material having a flexural strength of at least about 1,500 psi and a density of about 1.5 to 1.75 g/cc, in addition to having an electrical resistivity of 1,500 micro-Ohm-cm or greater, as described by Fiel et al., is known in the art. Fiel et al. teach a heating device being made of a graphite

material having the properties of a flexural strength of at least about 1,500 psi (most carbon and graphite materials having 4000-6000 psi; invention 10000 – 18000 psi; column 4, lines 5 – page 5, line 7; column 10, claim 9; see Table I) and a density of about 1.5 to 1.75 g/cc (of at least about 1.75 g/cc; column 10, claim 9; see Table I), in addition to an electrical resistivity of 1,500 micro-Ohm-cm or greater (450 –1200 micro-ohms-in converted to 1143 – 3048 micro-ohms-cm; see Table I). Fiel et al. further teach that an advantage of using the graphite material is its isotropic properties, such as electrical resistivity, thereby minimizing hot spots and avoiding the need for additional controlling of orientation of the fabricated element (column 4, lines 51-57). In addition, Fiel et al. disclose the advantage of flexibility as well as strength of the material, thereby providing the ability to easily shape elements without significant cracking (column 4, line 58 – column 5, line 7). Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the properties of the graphite material of Funari with the properties of the graphite material of Fiel et al. to minimize hot spots and avoid the need for additional controlling of orientation of the fabricated element as well as provide the ability to easily shape elements without significant cracking.

11. Claims 29-31, 33, 35, 36 and 56-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton (U.S. Patent No. 3,889,654) in view of Fiel et al. (U.S. Patent No. 5,414,927) as evidenced by Funari (U.S. Patent No. 4,171,477).

Walton discloses a portable soldering iron comprising a body (elongated housing 11) constructed of heat resistant material (insulating material; column 2, lines 25-29); a rechargeable battery means (25) disposed in the lower housing portion (12) of housing (11)(column 2, lines 47-52), a heating element (60 part of entire tip assembly 55) associated with the body (see Figures 1-7).

The claims differ from Walton in calling for the heating element being graphite material having an electrical resistivity of 1,500 micro-Ohm-cm or greater, a flexural strength of at least about 1,500 psi, and a density of about 1.5 to 1.75 g/cc. However, heating element having an electrical resistivity of 1,500 micro-Ohm-cm or greater, a flexural strength of at least about 1,500 psi, and a density of about 1.5 to 1.75 g/cc, as described by Fiel et al. and furthermore evidenced by Funari, is known in the art.

Fiel et al. teach a heating device (13) being made of a graphite material having an electrical resistivity of 1,500 micro-Ohm-cm or greater (450 –1200 micro-ohms-in converted to 1143 – 3048 micro-ohms-cm; see Table I), a flexural strength of at least about 1,500 psi (most carbon and graphite materials having 4000-6000 psi; invention 10000-18000 psi; column 4, lines 5 – page 5, line 7; column 10, claim 9; see Table I) and a density of about 1.5 to 1.75 g/cc (of at least about 1.75 g/cc; column 10, claim 9; see Table I), in addition to. Fiel et al. further teach an advantage of using the graphite material being isotropic properties, such as electrical resistivity, thereby minimizing hot spots and avoiding the need for additional controlling of orientation of the fabricated element (column 4, lines 51-57). In addition, Fiel et al. disclose the advantage of

flexibility as well as strength of the material, thereby providing the ability to easily shape elements without significant cracking (column 4, line 58 – column 5, line 7).

Funari teaches the advantage of using a soldering tip (column 9, lines 10-20; see Figure 6) constructed of a material that may include a large range of micro-ohm-cm based on the material, where the material of notability is a material combination of carbide and graphite having a resistivity of 3200 micro-ohms-cm and up (column 7, line 58 – column 8, line 12) to provide a soldering tip that heats up simultaneously as the soldering surface, thereby preventing the soldering tip from drawing off heat generated to the soldering surface; and to provide a soldering tip that heats up primarily because of contact resistance to the power generated by the current passing through the contact resistance, not the soldering surface itself, thereby providing better soldering fusion joints (column 4, lines 8-64).

Therefore, It would have been obvious to one of ordinary skill in the art at the time of the invention was made to substitute the heating element of Walton with the graphite heating element of Fiel et al. to minimize hot spots and avoid the need for additional controlling of orientation of the fabricated element as well as provide the ability to easily shape elements without significant cracking, since as evidenced by Funari, substituting a graphite heating element will provide a soldering tip heating element that heats up simultaneously as the soldering surface and that heats up primarily because of contact resistance to the power generated by the current passing through the contact resistance, not the soldering surface itself, thereby providing better soldering fusion joints.

12. Claims 32 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fiel et al. (U.S. Patent No. 5,414,927) in view of Sweetland (U.S. Patent No. 5,394,910).

The claims differ from Fiel in calling for the heating device having a thermal conductivity of less than or equal to 10 BTU/hr-ft-degree F.

Sweetland teaches that typical carbon and graphite used in high temperature applications have an average thermal conductivity of 8 BTU/hr-ft-degree F, Sweetland further teaches that some applications prefer high thermal conductivity ranges such as 50 or 60 BTU/hr-ft-degree F . It would have been obvious to one of ordinary skill in the art at the time of the invention was made to make having a thermal conductivity of less than or equal to 10 BTU/hr-ft-degree F, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art.

13. Claim 72 is rejected under 35 U.S.C. 103(a) as being unpatentable over Low (U.S. Patent No. 3,621,193) in view of Walton (U.S. Patent No. 3,889,654).

The claims differ from Low in calling for the electrical switch being disposed on the body of the soldering tool.

However, an electrical switch disposed on the body of a soldering iron for enabling and disabling the soldering iron, as described by Walton, is known in the art. Walton teaches a soldering iron having the a switch (push button 20) disposed on the

body of the soldering iron to provide a quick and easy way to enable and disable the soldering iron within the line of sight of the user, thereby providing a more user-friendly operation of the soldering iron. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the foot switch of Low with the push button on the soldering iron of Walton to provide a quick and easy way to enable and disable the soldering iron within the line of sight of the user, thereby providing a more user-friendly operation of the soldering iron.

14. Claims 79 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Walton (U.S. Patent No. 3,889,654) in view of Wahl (U.S. Patent No. 3,984,655).

The claims differ from Walton in calling for an interchangeable solder tip via a friction fit socket.

However, an interchangeable solder tip via a friction fit socket, as described by Wahl, is known in the art. Wahl teaches a cordless soldering iron with terminal members (15,16) having longitudinal openings (20) in the forward end and a spring member (25) fixed by screw (27) in opening (26)(column 2, lines 35-57). Wahl also teaches the flexed spring member (25) provides a means to secure electrodes (12,13) in place by the bias of the flexed spring member (25) and establish a good electrical connection (column 2, lines 58-68; see Figures 3, 4). This bias is inherently a frictional fit due to the spring member (25) applying a force to the electrodes (12,13). In addition, Wahl teaches the electrodes (12,13) may be further secured by screw (27)(see Figures 5,6). Similarly, the screw (27) is applying a force to the electrodes (12,13) and is also inherently a frictional

fit. Wahl further teaches that the advantage of such a mechanism provides the ability to attach and detach a plurality of tip of different shapes, sizes and capabilities quickly and easily, thereby improving the versatility of the soldering iron. It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Walton with the attach/detach mechanism of Wahl to provide the ability to use a plurality of tip of different shapes, sizes and capabilities quickly and easily, thereby improving the versatility of the soldering iron.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen J. Ralis whose telephone number is 571-272-6227. The examiner can normally be reached on Monday - Friday, 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Stephen J Ralis
Examiner
Art Unit 3742

SJR
December 15, 2006

ROBIN EVANS
SUPERVISORY PATENT EXAMINER
12/21/06